

Environmental Assessment for Testing of the Network Embedded Systems Technology (NEST) at Eglin Air Force Base (RCS 04-199)



FINAL

August 2004



Prepared for:

**The United States Air Force
Eglin Air Force Base
Ft. Walton Beach, FL**

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE AUG 2004		2. REPORT TYPE		3. DATES COVERED 00-00-2004 to 00-00-2004	
4. TITLE AND SUBTITLE Environmental Assessment for Testing of the Network Embedded Systems Technology (NEST) at Eglin Air Force Base				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) 96 Air Base Wing (ABW/EMSP),501 DeLeon Suite 101,Eglin AFB,FL,32542				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 47	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

FINDING OF NO SIGNIFICANT IMPACT

for

Testing of the Network Embedded Systems Technology (NEST)

RCS 04-199

Pursuant to the President's Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (40 Code of Federal Regulations [CFR] 1500-1517), and 32 CFR 989, the Department of the Air Force has conducted an Environmental Assessment (EA) of the probable environmental consequences associated with testing the technology of an intrusion detection system developed by the Defense Advanced Research Projects Agency (DARPA). This intrusion detection system consists of a network of sensors and is called the Network of Embedded Systems Technology (NEST).

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Proposed Action: The 46th Test Wing, Eglin AFB FL, proposes to utilize the Santa Rosa Island land areas between Eglin's Test Area (TA) A-13 (the 300-ft tower) and TA A-18 (the western most point of the island test range) to conduct testing of the NEST Program by DARPA. The layout of this western portion of the island, facilities and roadway are ideal for this NEST demonstration and testing.

The NEST demonstration test would consist of deploying 8,000 to 10,000 sensors spread over an area of approximately 1 km by 10 km. As described in Chapter One of the EA, two test/demonstration events are planned. The first event would be 1) a twelve-day dry run demonstration in October 2004. The second event would be 2) a twelve-day test demonstration in December 2004. The 300-ft tower at TA A-13 would be utilized as an observation point for the demonstration. It is anticipated that sensors will be deployed on days 1 and 2 of each event and retrieved on the final two days of each event. Use of powered vehicles (pick-up trucks and ATV's) in the test area would be required to initially place the sensors, and later to retrieve them. Environmentally sensitive areas would be avoided. Placing and retrieving the sensors will be labor intensive given the number of sensors and the area to be covered. The NEST area must be guarded for security purposes while the sensors are deployed.

The NEST sensors are cone-shaped and battery powered. Each sensor is approximately eight inches tall and eight inches wide at the base. Refer to the EA for a detailed description of the sensors and how they operate. They would be placed in a checkerboard pattern to form a network around an asset to be protected (a pipeline, for example). Sensors are portable and are placed on the surface of the ground (digging is not required).

No Action: The DARPA would not conduct the NEST test and demonstration at the Eglin Santa Rosa Island property.

Alternatives Considered, But Not Carried Forward for Analysis: The use of Eglin TA B-70 was considered, but was dismissed from further consideration due to range scheduling conflicts. It was virtually impossible to schedule an uninterrupted 12-day test and demonstration period on Eglin TA B-70. Eglin TA C-3 was also considered for the NEST test and demonstration. This test area is a designated security and sensor testing area and consists of approximately 750 acres. It was eliminated from further consideration because of its relatively small size and compact configuration.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and the EA, I conclude that the proposed NEST demonstration and test on Eglin AFB, Florida, will not have a significant adverse impact of a long-term nature to the quality of the human or natural environment. This analysis fulfills the requirements of the National Environmental Policy Act, the President's Council on Environmental Quality regulations, and 32 CFR 989. Therefore, an environmental impact statement is not required and will not be prepared.

8-19-04
Date

Vicki L. Preacher
VICKI L. PREACHER, GS-15
Director, Environmental Management

**Environmental Assessment for
Testing of the Network
Embedded Systems
Technology (NEST) at
Eglin Air Force Base
RCS 04-199**

**The United States Air Force
Eglin Air Force Base,
Ft. Walton Beach, Florida**

August 2004



Table of Contents

<u>Section</u>	<u>Page</u>
1	Purpose of and Need for Action..... 1-1
1.1	Introduction..... 1-1
1.2	Purpose and Need 1-4
1.3	Description of the Proposed Action..... 1-4
1.4	Scope of the Document and the Environmental Analysis..... 1-6
1.4.1	Resources Eliminated from Detailed Discussion 1-7
1.4.2	Resources Discussed in Detail 1-7
2	Alternatives Including the Proposed Action 2-1
2.1	Alternatives Considered for the EA 2-1
2.1.1	Preferred Alternative..... 2-1
2.1.2	No-Action Alternative..... 2-1
2.2	Alternatives Considered, but Eliminated from Further Consideration 2-1
2.3	Summary of Comparison of Alternatives 2-2
3	Affected Environment 3-1
3.1	Threatened and Endangered Species 3-1
3.2	Wetlands and Vegetation..... 3-7
3.3	Cultural Resources..... 3-8
3.4	Coastal Zone Management 3-9
4	Environmental Consequences 4-1
4.1	Threatened and Endangered Species 4-1
4.2	Wetlands and Vegetation..... 4-2
4.3	Cultural Resources..... 4-3
4.4	Coastal Zone Management 4-4
4.5	Environmental Justice/Protection of Children from Environmental Health Risks..... 4-4
4.6	Mitigation Measures 4-5
4.7	Cumulative Impacts 4-5
5	Plans, Permits, and Management Requirements..... 5-1
6	List of Preparers 6-1
7	References 7-1

Table of Contents (cont.)

<u>Section</u>	<u>Page</u>
----------------	-------------

Appendix

A	Coastal Zone Management Act Negative Determination	A-1
----------	---	------------

List of Tables

Table

Page

2-1	Summary Comparison of Alternatives.....	2-2
3-1	Documented Sea Turtle Nests, Test Sites A-6 through A-18, Santa Rosa Island, Eglin AFB	3-4

List of Illustrations

<u>Figure</u>		<u>Page</u>
1-1	Site Location Map, Eglin AFB	1-2
1-2	Test Areas, Proposed NEST Testing Location, Eglin AFB, SRI, Florida	1-3
1-3	NEST Sensor Diagram, Eglin AFB	1-5
3-1	Sensitive Areas, Proposed NEST Testing Location, Eglin AFB, SRI, Florida	3-3

List of Acronyms

46 TS	The 46 th Test Squadron
46 TW	The 46 th Test Wing
96 ABW/EMH	96 th Air Base Wing/Environmental Management Directorate, Historic Preservation Division
96 ABW/EMSN	96 th Air Base Wing/Environmental Management Directorate, Stewardship Division, Natural Resources Branch
AFB	Air Force Base
ATV	all-terrain vehicle
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DARPA	Defense Advanced Research Projects Agency
DoD	Department of Defense
DV	distinguished visitors
EA	Environmental Assessment
EMR	electromagnetic radiation
EO	Executive Order
FCMP	Florida Coastal Management Program
FDEP	Florida Department of Environmental Protection
FNAI	Florida Natural Areas Inventory
GHz	gigahertz
kg	kilograms
m	meter
MHz	megahertz
mm	millimeters
mW	milliwatts
NEPA	National Environmental Policy Act
NEST	Network of Embedded Systems Technology
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NRC	National Research Council
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OA HITL	Open Air Hardware in the Loop
PEA	Programmatic Environmental Assessment
PIR	passive infra-red
RF	radio frequency
ROI	Region of Influence
SHPO	State Historic Preservation Officer
SRI	Santa Rosa Island
T&E	threatened and endangered
USAF	United States Air Force
USFWS	United States Fish and Wildlife Service

1.1 Introduction

The United States Air Force (USAF) proposes to use certain areas of the Eglin Air Force Base (AFB) Santa Rosa Island (SRI) test areas to conduct field demonstration testing on a network of intrusion detection sensors that have been developed by the Defense Advanced Research Projects Agency (DARPA). This network of sensors is called the Network of Embedded Systems Technology (NEST) Program. NEST was designed to provide protective surveillance for long, linear sources such as pipelines, and it could be used for a variety of other security applications, such as railroad and bridge protection. The testing is proposed by and would be coordinated by the 46th Test Wing (46 TW), under the 46th Test Squadron (46 TS), at Eglin AFB.

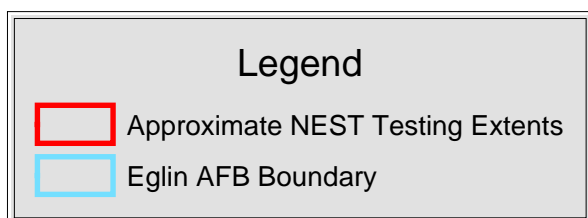
Eglin AFB, located in northwest Florida, is one of the largest Air Force Bases in the world, covering 724 square miles of reservation and 97,963 square miles of water ranges. The main contiguous parcel of Eglin AFB contains approximately 464,000 acres and is located in Walton, Okaloosa, and Santa Rosa counties along the Gulf of Mexico (see Figure 1-1). SRI is a narrow barrier island, approximately 50 miles long and 0.5 miles wide, separated from the mainland by Santa Rosa Sound and Choctawhatchee Bay. Eglin AFB controls 4,760 acres of SRI: a 4-mile-long strip eastward of Ft. Walton Beach and a restricted access 13-mile-long section extending west to Navarre Beach. Within the Eglin AFB property, the island is approximately 0.5 miles at the widest and 0.3 miles at the narrowest. There are 2.5 miles of Okaloosa County-owned property between the two parcels of Eglin property (USAF 1997). The proposed NEST testing would occur between Test Area A-13 and Test Area A-18 (see Figure 1-2).

The DARPA is the central research and development organization for the Department of Defense (DoD). It manages and directs selected basic and applied research and development projects for DoD, and pursues research and technology where risk and payoff are both very high and where success may provide dramatic advances for traditional military roles and missions. The DARPA mission is to develop imaginative, innovative and often high-risk research ideas offering a significant technological impact that will go well beyond the normal evolutionary developmental approaches; and, to pursue these ideas from the demonstration of technical feasibility through the development of prototype systems (www.darpa.mil).



SOURCE: USAF 2000.

Figure 1-1 SITE LOCATION MAP
EGLIN AIR FORCE BASE




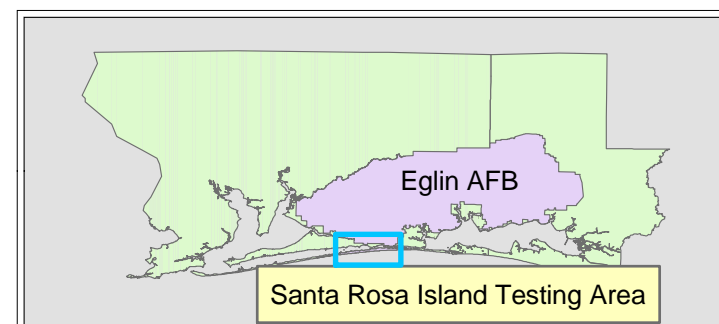

 Test Areas
 Proposed NEST Testing Location
 Eglin AFB, Santa Rosa Island, Florida

Figure 1-2



The NEST sensors are cone-shaped and battery-powered, and approximately 8 inches tall and 8 inches wide at the base. The sensors are in a network and detect seismic activity, motion (with passive infra-red [PIR] sensors), noise (with acoustic holes), and the presence of metals (with a magnetometer) (see Figure 1-3). They are sensitive enough to detect footfalls or other activities of intruders. When a sensor detects such activity, it communicates with other sensors and with several hubs located within the network. The hubs (also called gateways) are slightly larger than the sensors and box-shaped. There would be approximately 300 hubs in the network. If an intruder were to approach the asset being protected (a pipeline, for example) sensors would detect the seismic activity of the intruder and would relay that data to a hub within the network and ultimately to an operator with a display screen. All data is relayed by radio frequency (RF) means and no hard wiring is required. The intruder's movements can be determined by the sensors and data transmissions (of the hub) to the operator. The sensors would be powered by two AA alkaline batteries, and operate on 430 megahertz (MHz) to 436 MHz, with an output power of 10 mW (milliwatts), and a range of 500 feet. The hubs would be powered by 12-volt sealed lead-acid batteries, and would operate on 2.4 gigahertz (GHz), with an output power of 1.6 watts.

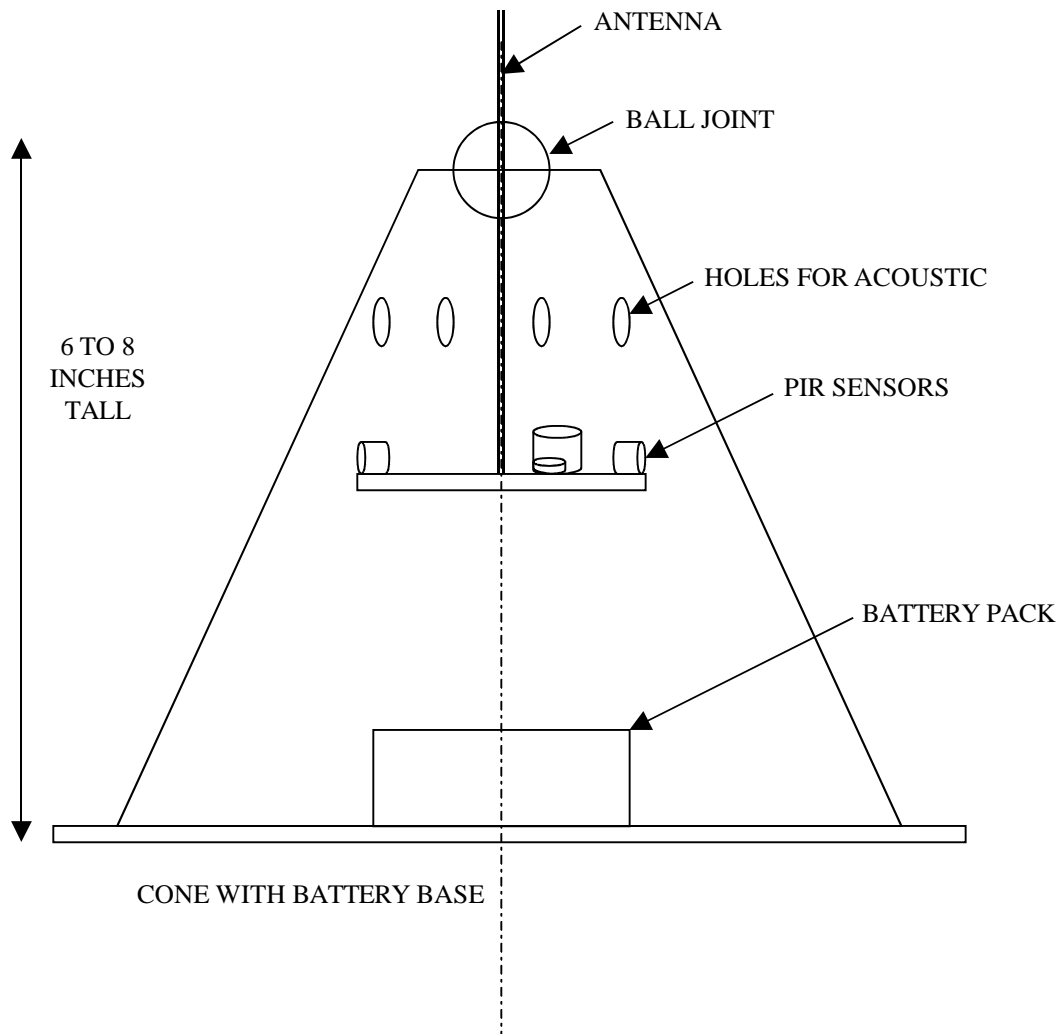
The site requirements needed for this test include a site that is relatively flat and open, and offers a real world environment of varying topography of a long, linear nature no less than 5 miles in length. This would provide a realistic layout of a linear resource being protected, such as a pipeline. The test area may be irregularly shaped, but sufficient area is needed to accommodate the abundance of sensors. Light to moderate vegetation is ideal, but large physical obstructions (thick forests, groups of large buildings) would interrupt the line of sight communications. An uninterrupted 12-day period for each test is necessary to collect data.

1.2 Purpose and Need

DARPA has tested an array of a small number of the NEST sensors, but a large-scale field exercise (i.e., the Proposed Action) is needed to test the functionality and compatibility of 8,000-10,000 sensors in a network. The purpose of the Proposed Action is to conduct a test that demonstrates the effectiveness of the NEST intrusion detection system.

1.3 Description of the Proposed Action

The Proposed Action is to conduct testing of the NEST Program at Eglin's SRI land areas between Test Area A-13 (near the Open Air Hardware in the Loop [OA HITL] tower) and Test Area A-18 (the western-most point of the SRI test range).



SOURCE: DARPA, 2004.

**Figure 1-3 NEST SENSOR DIAGRAM
EGLIN AIR FORCE BASE**

Two NEST demonstration tests would be conducted using 8,000 to 10,000 sensors spread over an area of approximately 0.6 miles by 6 miles. The first event would be a 12-day dry run demonstration in October 2004. The second event would be a 12-day test demonstration in December 2004. Distinguished visitors (DVs) would be invited to the second test, and would utilize the OA HITL Tower at Test Area A-13 for observation.

The sensors would be deployed on the first two days of each event and retrieved on the final two days of each event. Pick-up trucks and all-terrain vehicles (ATV's) would be used to deploy the sensors, and later to retrieve them. The paved road running the length of the test area would serve as a baseline for deploying and recovering the sensors. The road would also simulate a long, linear asset being protected during the test. The NEST area would be guarded during the 12-day events by an on-site guard. Approximately 25 staff from DARPA and 46 TS would deploy and retrieve the sensors. The 46 TS would also provide the vehicles to be used and the guard for monitoring the site.

The NEST sensors would be placed in a checkerboard pattern to form a network around the road. Sensors would be placed on the surface of the ground and would be spaced approximately 20 to 40 meters apart. Once the sensors are in place, intrusions would be simulated at various times throughout the test event (during the day; no simulations would occur at night). Intrusion simulations would consist of a small team of military personnel approaching the asset (the paved road simulating a pipeline) on foot. The sensors would then record and relay the intrusion detection to the operator (on a laptop computer manned by DARPA personnel on-site). DARPA personnel would use an existing building within the project site (e.g., at Test Area A-15) as their command and control center during the testing event.

1.4 Scope of the Document and the Environmental Analysis

This Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations implementing NEPA (Title 40 of the Code of Federal Regulations [CFR], Parts 1500-1517), and 32 CFR 989 (Environmental Impact Analysis Process).

This EA is based on information obtained during a site visit conducted in June 2004, personal interviews and correspondence with Air Force personnel, and review of documents listed in the reference section of this report. This EA describes the existing environmental conditions; identifies reasonable alternatives; evaluates the direct, indirect, and cumulative impacts that may result from the Proposed Action; and identifies measures to minimize potential adverse effects. Plans, permits, and management requirements are also discussed.

This EA examines a variety of resources related to the Proposed Action. Resources relevant to the Proposed Action are considered in detail, and those that are not relevant have been eliminated from further discussion.

1.4.1 Resources Eliminated from Detailed Discussion

No impacts would occur to the following resources as a result of the Proposed Action, and therefore, these resources are not addressed in this EA:

- **Noise:** There would be no noise impacts; deployment and retrieval would be done by foot and light ATV/pick-up trucks.
- **Air Quality:** Emissions from vehicle usage during the Proposed Action would have a negligible effect on air quality.
- **Land Use:** There would be no impacts to land use, as there would be no changes to the testing area's land use.
- **Geology and Soils:** There would be no impacts to geology or soils, as no digging or ground-intrusive activities would occur.
- **Socioeconomic:** There would be no impacts to socioeconomic conditions, as there are no proposed changes in personnel, spending, or housing.
- **Environmental Contamination:** There would be no impacts to or from environmental contamination, as there will be no hazardous substances used in the testing area, or disturbance of contaminated areas.
- **Safety:** The 46 TS would develop a Safety Plan and conduct safety briefings for personnel and activities involved in the NEST test demonstrations. Any safety issues or concerns would be coordinated with Eglin AFB personnel.

Therefore, these resources are not addressed further in this EA.

1.4.2 Resources Discussed in Detail

The following resources are discussed in detail in the EA as explained:

- **Threatened and Endangered Species.** The project area provides habitat for several threatened and endangered species; therefore the Proposed Action has the potential to impact these species.
- **Wetlands and Vegetation.** Deployment and retrieval of the sensors has the potential to impact the wetlands and coastal vegetation on the project site.
- **Cultural Resources.** Deployment and retrieval of the sensors has the potential to impact the cultural resources on the project site.

- **Coastal Zone.** The Proposed Action would occur in the designated coastal zone of the State of Florida, therefore potential impacts to the coastal zone must be considered and the Proposed Action must be consistent to the maximum extent practicable with the enforceable policies of the Florida Coastal Management Program (FCMP).
- **Environmental Justice.** Per Executive Order (EO) 12898 and EO 13045, environmental justice will be discussed within the EA.

2 Alternatives Including the Proposed Action

This section describes the alternatives considered, including the Preferred Alternative. Section 2.1 describes the alternatives, including the Preferred Alternative, and the No-Action Alternative. Section 2.2 discusses those alternatives considered, but eliminated from further discussion. Section 2.3 summarizes the environmental consequences of each alternative.

2.1 Alternatives Considered for the EA

The alternatives to be discussed in this EA include: (1) the Preferred Alternative, use of the Eglin AFB SRI property for NEST test demonstrations; and (2) the No-Action Alternative, no use of the Eglin AFB SRI property for NEST test demonstrations.

2.1.1 Preferred Alternative

The Preferred Alternative is the Proposed Action. It is to conduct testing of the NEST Program at the Eglin AFB SRI property (Test Area A-13 to Test Area A-18). Two 12-day tests would occur, one in October 2004 and one in December 2004. Between 8,000 and 10,000 cone-shaped sensors would be deployed in a checkerboard pattern around the existing road and would detect simulated intrusions. Intrusions would be simulated by a team infiltrating the site on foot throughout the test event (during the day; no activities would occur at night). Additional details of the Proposed Action are discussed in Section 1.3.

2.1.2 No-Action Alternative

Under the No-Action Alternative, DARPA would not conduct the NEST test demonstrations at the Eglin AFB SRI property.

2.2 Alternatives Considered, but Eliminated from Further Consideration

Two additional alternatives were considered for the NEST test demonstrations, but eliminated from further consideration: Test Area B-70 and Test Area C-3. Test Area B-70 is a large, linear test area with a high-utilization rate schedule for aircraft and munitions testing and training. Scheduling an

uninterrupted 12-day test and demonstration period on Eglin Test Area B-70 would be extremely difficult as mission priorities dictate use of the range, and there is no guarantee the range would be available for the 12-day period when requested/needed. Therefore, this alternative was eliminated from further consideration due to scheduling conflicts. Test Area C-3 was also considered for the NEST test demonstrations. This Test Area is a designated security and sensor testing area and consists of approximately 750 acres. It was eliminated from further consideration because of its relatively small size and compact configuration (does not meet site requirements).

2.3 Summary of Comparison of Alternatives

Table 2-1 summarizes and compares the alternatives regarding the relevant issues discussed in detail in this EA (as outlined in Section 1.4.2).

Table 2-1. Summary Comparison of Alternatives

Resources	Proposed Action	No-Action Alternative
Threatened and Endangered Species	No impacts anticipated. All listed species' habitat areas would be designated and access would be restricted/prohibited. No electromagnetic radiation (EMR) impacts are anticipated to the biological resources due to the spacing of the sensors and the short-duration of the tests.	No impact anticipated.
Wetlands and Vegetation	Minor impacts to vegetation could occur. Vehicles would be prohibited in vegetated/wetland areas. Sensors could be placed by personnel on foot in these areas. Trampling of vegetation would be minimized or avoided to the maximum extent practicable (dune vegetation).	No impact anticipated.
Cultural Resources	No impacts anticipated. All sensitive areas would be designated and access would be restricted/prohibited.	No impact anticipated.
Coastal Zone	No impact anticipated. Vehicles would not be used in sensitive areas (e.g., vegetated areas, habitat for protected species). A Record of Negative Determination was submitted to Florida Department of Environmental Protection (FDEP); FDEP concurred with this determination.	No impact anticipated.

This section describes the potentially affected environmental resources within the areas of the Proposed Action.

3.1 Threatened and Endangered Species

Four federally-listed threatened and endangered (T&E) species and one state-designated species are known to occur in the proposed NEST testing areas:

- Santa Rosa Beach Mouse (State-designated by Florida Natural Areas Inventory [FNAI], Critically Imperiled)
- Piping Plover (Federally-Listed and State-Listed, Threatened)
- Green Sea Turtle (Federally-Listed and State-Listed, Endangered)
- Leatherback Sea Turtle (Federally-Listed and State-Listed, Endangered)
- Loggerhead Sea Turtle (Federally-Listed and State-Listed, Threatened).

This section provides a brief description of the above species' distributions and ranges, habitat needs, and other biological requirements. The following sources were used to determine species occurrence near the sensor test:

- *Integrated Natural Resources Management Plan, Eglin AFB, FL* (USAF 2002)
- *Rare and Endangered Biota of Florida, Vol. III (Reptiles and Amphibians)* (Moler 1992)
- *Rare and Endangered Biota of Florida, Vol. V (Birds)* (Rodgers *et al.* 1996)
- *Rare Amphibian and Reptile Survey of Eglin AFB, Florida* (Printiss and Hipes 1999)
- Eglin AFB Natural Resources GIS data (<http://gisweb.eglin.af.mil>)

Santa Rosa Beach Mouse

The Santa Rosa beach mouse (*Peromyscus polionotus leucocephalus*) is listed as being critically imperiled in Florida by FNAI because of extreme rarity (5 or fewer occurrences or less than 1,000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

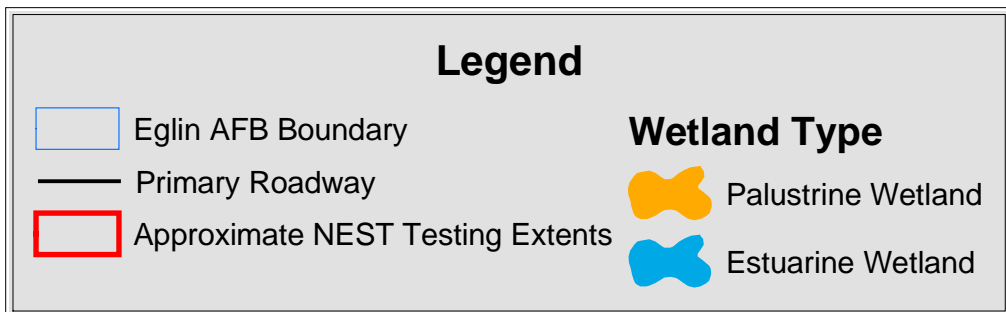
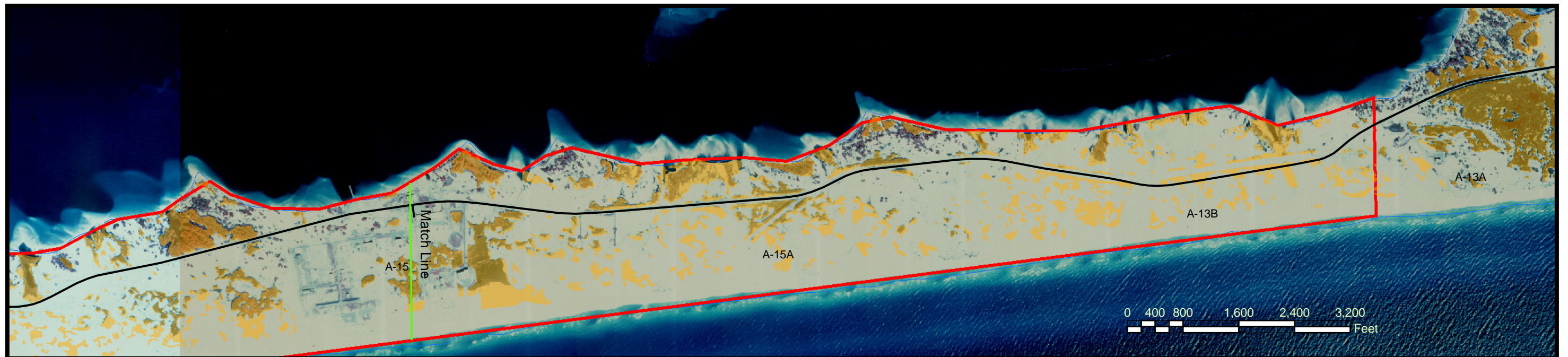
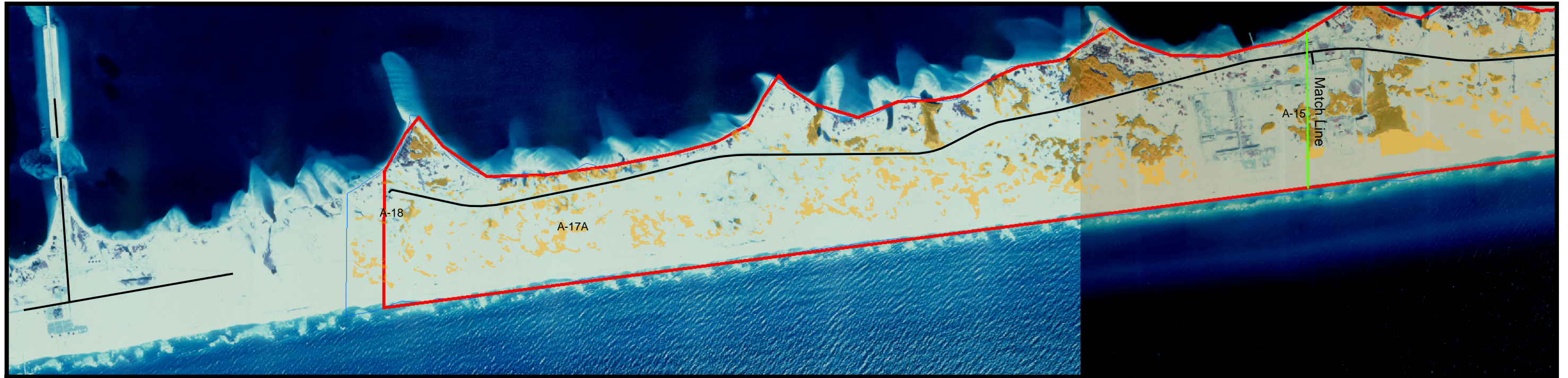
The habitat requirements for the Santa Rosa beach mouse include the primary, secondary, and tertiary sand dunes with a moderate cover of grasses and forbs, including sea oats (*Uniola paniculata*), bitter panicum (*Panicum amarum*), gulf bluestem (*Schizichyrium maritimum*), beach dropseed (*Sporobolus virginicus*), and telegraph weed (*Heterotheca subaxillaris*). High, stable areas with sand live oak (*Quercus geminata*) that are not as affected by hurricanes may be important when substantial dune habitat is removed after large storms (FNAI 2001). Home ranges of mice in the dunes are much smaller than those in areas of more substantial cover, but when there are food shortages in the spring, mice may search larger areas. Beach mice are primarily nocturnal and spend most of the daylight hours in burrows (Bowen 1968).

All populations of *Peromyscus polionotus* have family units characterized by a high degree of monogamy (Wooten 1994). Timing of reproduction in the Santa Rosa beach mouse has been suggested to be in the wintertime, and little reproductive activity happens in the summer (Blair 1951). In captive colonies, litters are from one to seven offspring, while in the natural environment the average is three (Wooten 1994). Breeding is influenced by season, body size, and female age.

The Santa Rosa beach mouse is a subspecies of the oldfield mouse. Similar subspecies are found throughout Alabama, Georgia, southern South Carolina, and northern Florida (FNAI 2001). This subspecies is the most secure population of beach mice due to its occurrence only on the restricted access portion of Eglin's beach property. Prior to Hurricane Opal, Eglin AFB supported one of the healthiest and largest populations of beach mice in northwest Florida and Alabama. At least half of the suitable dune habitat on SRI was destroyed by the storm surge during Hurricane Opal, and the remaining habitat was fragmented into isolated dune remains separated by large expanses of open sand. A joint study by the Eglin Natural Resources Branch and University of Florida showed the population of Santa Rosa beach mice has rebounded, probably due to the high reproductive capacity of the species and the recovery of dune vegetation following the hurricane (USAF 1999).

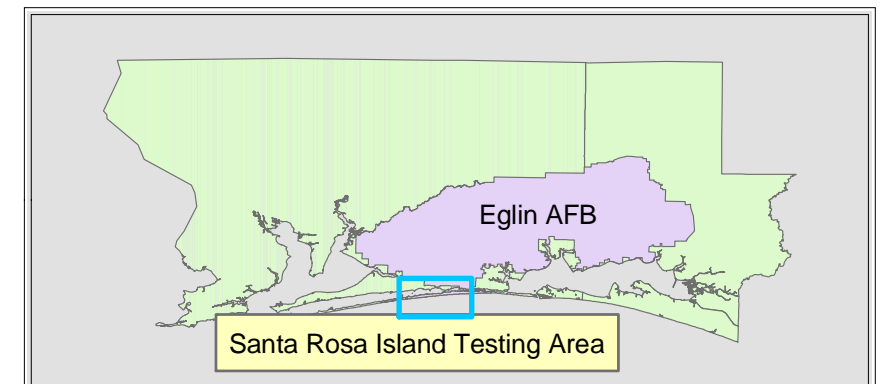
Piping Plover

The piping plover (*Charadrius melodus*) is a federally-listed and state-listed threatened species. The habitat requirements for the piping plover include sandy beaches, river sandbars, and wetlands for breeding, and barrier islands during the wintering period. Piping Plovers tend to return to the same wintering location each year. Foraging, using a "stop-run-peck" style, usually happens on sandflats, mudflats, and sometimes on the lower beach or dredge spoils. Their diet is not well-known, but consists




 Sensitive Areas
 Proposed NEST Testing Location
 Eglin AFB, Santa Rosa Island, Florida

Figure 3-1



of various invertebrates found in the intertidal zone. In winter, 76 percent of the plover's time is spent foraging due to high-energy requirements (Rodgers *et al.* 1996).

Although not well defined, the winter range of the piping plover ranges from North Carolina to the Florida Keys on the Atlantic Coast, from Florida to Texas on the Gulf Coast, and sometimes in the Caribbean. Larger groups tend to congregate on the Gulf Coast, with designated critical habitat on the western end of Eglin AFB SRI Property about 0.5 mile east of State Road 399 in Navarre. This designated critical habitat (wintering habitat) of the piping plover is on the north side of the road and is along the western-most extent of the NEST testing area. (United States Fish and Wildlife Service [USFWS] 2001).

Green Sea Turtle

The green sea turtle (*Chelonia mydas*) is a federally and state-listed endangered species. Green sea turtles are mainly herbivores, feeding on marine algae and shallow water grasses. When they are juveniles, they feed on plants and organisms such as crabs, jellyfish, sponges, snails, and worms (Ernst 1994). Green sea turtles are the only sea turtles that, as adults, are strict herbivores.

Green sea turtles mature in the range of 10 to 24 years, and breeding season differs according to latitude. In Florida waters, the breeding and nesting season occurs from May to September, with nesting occurring more so in the latter months (Ehrhart and Witherington 1992). Females return to the same beach where they were born to lay their eggs. Eggs are typically buried at a depth of 18 inches at a suitable location well above high-tide line and shoreward of the primary dune line. Gestation usually ranges from 40 to 72 days (Marquez 1990). Once the eggs hatch, the juvenile turtles head straight to the water where males spend all of their life. Up to 22 green sea turtle nests have been surveyed on Eglin property on SRI each year from 1989 to 2003 (see Table 3-1).

Table 3-1. Documented Sea Turtle Nests, Test Sites A-6 through A-18, SRI, Eglin AFB

Year	Loggerhead	Green	Leatherback	Total
1989	20	-	-	20
1990	22	8	-	30
1991	21	-	-	21
1992	16	11	-	27
1993	20	-	-	20
1994	21	15	-	36

Table 3-1 (continued). Documented Sea Turtle Nests, Test Sites A-6 through A-18, SRI, Eglin AFB

Year	Loggerhead	Green	Leatherback	Total
1995	16	-	-	16
1996	17	11	-	28
1997	19	1	-	20
1998	16	10	-	26
1999	15	-	-	15
2000	27	22	3	52
2001	12	-	-	12
2002	9	11	-	20
2003	19	4	-	23

Green sea turtles live in warm tropical waters around the world. Occasionally, they can range as far north as Alaska or New England and as far south as South Africa. Breeding usually occurs in warmer areas such as Florida or the Caribbean.

All sea turtle eggs and juvenile turtles are prey for many terrestrial and marine species including: opossum, raccoons, coyotes, ghost crabs, fish, and birds. Human impacts on the green sea turtle include: disruption of nests, collecting eggs and/or turtles for food, coastal development, commercial fishing bycatch, and marine pollution. In particular, the green turtle has been impacted by demand for its eggs and meat for human food (National Research Council [NRC] 1990). Green turtles are also more sensitive to lights on beaches than other turtles (Ehrhart and Witherington 1987). This sensitivity to light can cause misorientation in hatchlings, which lead to hatchlings heading away from water possibly resulting in death from desiccation, predation, or man-made factors. Degradation of nesting and feeding habitats is also a serious problem. Due to the long period of time required to reach maturity in green turtles, species recovery will not happen quickly (NRC 1990).

Leatherback Sea Turtle

The leatherback turtle (*Dermochelys coriacea*) is a federally-listed and state-listed endangered species. This is the largest species of living turtle. Adults average a carapace length of 5 to 7 feet (152 to 213 millimeters [mm]) and a weight of 650 to 1,200 pounds (295 to 545 kilograms [kg]) (Bronsgerma 1976). Leatherbacks are omnivorous, with a diet consisting of sea grasses, jellyfish, crustaceans, mollusks, tunicates, and small fish.

Once the turtles mature, they breed once every 2 to 4 years on beaches in warm tropical areas throughout the world. Just as other sea turtles, the leatherbacks return to the same beach that they were born to lay eggs, but their site fidelity is the least accurate of all the sea turtle species. Their gestation period is about 60 days, and once the eggs are hatched, only females will ultimately return to land to lay eggs. Nesting sites in Florida are rare. Three leatherbacks nested on Eglin AFB beach property in 2000 (see Table 3-1) (Miller 2002), and hatchlings have been reported off Destin, approximately 10 miles east of SRI (Pritchard 1992).

All sea turtle eggs and juvenile turtles are prey for many terrestrial and marine species including opossum, raccoons, coyotes, ghost crabs, fish, and birds. Human impacts on the leatherback turtle include disruption of nests, collecting eggs and/or turtles for food, coastal development, commercial fishing bycatch, and marine pollution. In particular, egg collecting and ingestion of plastics are major threats to the leatherback (NRC 1990).

Loggerhead Sea Turtle

The loggerhead turtle (*Caretta caretta*) is a federally-listed and state-listed threatened species. Loggerheads are medium to large turtles that, in Florida, range in length from 2.3 to 4.1 feet (0.70 to 1.25 meters [m]) and in weight from 155 to 400 pounds (70 to 180 kg) (Dodd 1992). This species of turtle is strictly carnivorous with a diet of mollusks, jellyfish, crustaceans, sponges, and fish.

Loggerheads are the only species of sea turtle that can successfully nest on beaches outside of the tropics, and like other sea turtles, they return to the same beach where they hatched to lay eggs. The gestation period for the loggerhead usually ranges from 50 to 75 days, depending on nest temperature (Dodd 1992). In the U.S., the major nesting areas are from North Carolina to South Florida and the coastline along the Gulf of Mexico. On the SRI Eglin AFB property, there has been a range of 12 to 27 loggerhead turtle nests documented each year from 1989 to 2001 (see Table 3-1). All sea turtle eggs and juvenile turtles are prey for many terrestrial and marine animals including opossum, raccoons, coyotes, ghost crabs, fish, and birds. Human impacts on the loggerhead turtle include disruption of nests, collecting eggs and/or turtles for food, coastal development, commercial fishing bycatch, and marine pollution. In addition to these threats, loggerheads are also susceptible to oil-platform removal, dredging, ingestion of plastics, and boat collisions (NRC 1990).

3.2 Wetlands and Vegetation

Within the Eglin AFB SRI property there are two important ecological resources that are essential to a barrier island ecosystem's carrying capacity and survivability. Wetlands and vegetation provide habitat for foraging, nesting, breeding, and protective cover to many avian species, as well as other more land-dependent wildlife species. Vegetation, within and outside of wetlands, provides an anchoring effect stabilizing and providing a foundation for dunes and the island as a whole.

Wetlands

Palustrine

Most wetlands that exist on Eglin AFB SRI property are palustrine (freshwater) wetlands. These palustrine wetlands are predominately found in interdunal swales (troughs between dune ridges) and depressional features. Palustrine wetlands can only exist in this salty environment due to runoff from adjacent dunes and the presence of groundwater near the soil surface.

These wetlands are characterized as shallow, closed basins with outlets only in times of extremely high water; have peat or sand substrate; are usually inundated; and contain woody or herbaceous wetland vegetation. Over 90% of wetland acreage on Eglin AFB SRI property is palustrine in nature. All wetland locations on SRI property identified by USFWS National Wetlands Inventory (NWI) can be seen in Figure 3-1.

Estuarine

Estuarine wetlands are found wherever tidal salt waters frequently inundate interior portions of the island, including a few small pockets along the northern shore of SRI where small inlets occur. Tree and shrub vegetation species are limited in estuarine wetlands; however, sea myrtle, wax myrtle, and sea-oxeye do exist. Herbaceous species include sawgrass, black needle rush, and salt marsh mallow. Soils associated with estuarine wetlands in this area are poorly drained muck or sandy clay loams underlain by loamy sand. Ten percent of wetlands on Eglin AFB SRI property are estuarine, and are shown in Figure 3-1.

Vegetation

A classification of ecological associations has been developed based on flora, fauna, and geophysical characteristics. These ecological associations are described in the *Integrated Natural Resources Management Plan*, Eglin AFB (USAF 2002b). The Coastal Upland Community type is the only vegetative community type found on the NEST testing area. Within this community are sand

beaches, dunes, coastal grassland, coastal interdunal swales, mesic flatwoods, and scrub community. In the sand beaches community, little vegetation is present aside from sporadic occurrences of sea oats (*Uniola paniculata*). The dune community includes the same sea oat, although more common, and other species such as bitter panicum (*Panicum amarum*), beach elder (*Iva imbricata*), seashore paspalum (*Paspalum distichum*), and Gulf bluestem (*Schizachyrium maritimum*). Coastal grassland community is a transitional zone separating the dynamic communities of the beach/dunes from the more stable interior communities. Frequently, the herbaceous species of the coastal grassland community occupy areas of newly deposited sands. The most dominant species of grasses within this community are the Gulf bluestem, sand squares (*Paronychia erecta*), telegraph weed (*Heterotheca subaxillaris*), and Godfrey's goldenaster (*Chrysopsis freyi*) (U.S. Air Force 1997). Coastal interdunal swales are where many hydrophytic vegetative species tend to occur such as beakrush (*Rhynchospora spp.*), sawgrass (*Cladium jamaicense*), white-topped sedge (*Dichromena colorata*), and Gulf cordgrass (*Spartina spartinae*). Mesic flatwoods tend to occur on the north side of the paved road that traverses the SRI test areas. Dominant species in this community are slash pine (*Pinus elliotti*), and yaupon (*Ilex vomitoria*). Scrub communities occur in various instances throughout the proposed NEST testing area, mostly occurring alongside the mesic flatwoods communities. The scrub vegetative community consists of saw palmetto (*Serenoa repens*), slash pine, scrub oak (*Qercus geminata*), rosemary (*Ceratiola ericoides*), and woody goldenrod (*Chrysoma pauciflosculosa*).

3.3 Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effect of the agency's undertakings on properties included in or eligible for inclusion in the National Register of Historic Places (NRHP). To date, several such properties within the Eglin AFB SRI property have been designated in the NRHP. This is a result of various investigations that have been conducted on Eglin AFB SRI property the past three decades.

In the 1980's Eglin AFB conducted surface surveys of SRI, which includes the proposed NEST testing areas. In 2002, Eglin AFB, in consultation with the State Historic Preservation Officer (SHPO), reevaluated the island property. The results of these surveys deemed the island a High Probability Zone for occurrence of archaeological resources due to discovered resources and proximity to water bodies.

Archaeological survey and testing was initiated in 2003 with new technologies and revealed many additional potential archaeological sites. All of the Eglin AFB SRI property has been surveyed using the more precise methods. Not all results from the most recent surveys are available. The proposed NEST testing location is also considered a High Probability Zone for eligible resources.

For portions of Eglin AFB SRI property in which survey results are available, over 35 potential archaeological sites have been documented. Many of these sites have produced ceramic artifacts, subsistence remains, and evidence of other historic occupation. Due to site sensitivity, exact locations of cultural resource sites are not shown. There is one identified cultural resources area within the project boundaries. This area has been surveyed, but eligibility for NRHP has not been determined.

3.4 Coastal Zone Management

Eglin AFB is located within the State of Florida's designated coastal zone. The Florida Coastal Management Program (FCMP), the State's federally approved coastal management program, was approved by the National Oceanic and Atmospheric Administration (NOAA) in 1981. The FCMP is a compilation of 23 Florida statutes that are administered by 11 state agencies and four of the five state water management districts. It is designed to ensure the wise use and protection of the State's water, cultural, historic, and biological resources; to minimize the State's vulnerability to coastal hazards; to ensure compliance with the State's growth management laws; to protect the State's transportation system; and to protect the State's proprietary interest as the owner of sovereign submerged lands. The USAF reviews activities with the potential to impact the coastal zone and makes a determination if it would have no effect (Negative Determination) or may have an effect but is consistent with the FCMP. The USAF ensures that its operations, activities, projects, and programs with the potential to affect coastal uses or resources are consistent to the maximum extent practicable with the FCMP. Consistency with the statutes constitutes consistency with the FCMP.

This section discusses potential environmental impacts associated with the Preferred Alternative and the No-Action Alternative. The section is organized in the same manner as Section 3 and addresses only those resources potentially affected by the Proposed Action. Management requirements that correspond with the impacts analysis are discussed in Section 5.

4.1 Threatened and Endangered Species

Preferred Alternative

No significant EMR impacts are anticipated to wildlife on-site due to the spacing of the sensors (spread out over a 1 km x 10 km area; buffered from sensitive areas), and the short duration of exposure (two 12-day events). The scale of radiation emissions relative to the overall earth's electromagnetic field and the other military activities on the Eglin AFB SRI property is not significant.

Coordination with the USFWS has been accomplished by Eglin Natural Resources Biologists as requested in the Florida State Clearinghouse e-mail of June 10, 2004, Appendix A.

Santa Rosa Beach Mouse

No significant, adverse short-term or long-term impacts to the Santa Rosa beach mouse are anticipated from the proposed action. The Santa Rosa beach mouse is known to occur in dunes greater than 5 feet tall. Subsequently, dunes meeting this parameter (5 feet above the immediate surrounding area) would be avoided during all proposed activities.

Piping Plover

No significant, adverse short-term or long-term impacts to the Piping Plover are anticipated from the proposed action. One area located within the extreme western portion of the testing area is considered critical wintering habitat for the Piping Plover. This habitat area lies north of the existing paved road, which is an area that does not meet terrain requirements needed for proposed activities. Nevertheless, since the proposed tests are during October and December, this area would be clearly marked on the ground before project activities occur and vehicles and personnel would be prohibited from entering this area at any time during the proposed tests.

Sea Turtles

No significant, adverse short-term or long-term impacts to sea turtles are anticipated from the proposed action. Locations between the surf and primary dune line, within the proposed testing area, are considered nesting habitat for sea turtles. The shoreline is patrolled everyday during nesting and hatching season by qualified professionals to locate, mark (on-site), and monitor sea turtle nests. The first proposed NEST demonstration test would occur during October, which is at the end of sea turtle hatching season. Proposed activities (deployment/retrieval of the sensors and intrusion simulations) would be prohibited within 50 feet of marked nests. Coordination with Eglin AFB Natural Resources Branch would be required prior to deployment of the sensors so that all known nests can be identified and avoided. If turtle nests are present during activities, personnel would be required to rake out ruts created by ATVs.

No-Action Alternative

No significant, adverse short-term or long-term impacts to any T&E species are anticipated from the No-Action Alternative. Under the No-Action Alternative, NEST testing activities at Eglin AFB SRI property would not occur.

4.2 Wetlands and Vegetation

Preferred Alternative

Wetlands

No significant, adverse short-term or long-term impacts to wetland resources are anticipated from the proposed action. Several areas of wetlands are located within the proposed testing location. Vehicular traffic during deployment and retrieval activities would be prohibited from traversing wetland areas. Test sensors can be placed within wetland areas by foot, but trampling of vegetation would be avoided/minimized. Wetland areas would not be marked due to their abundance. Vehicles would not be allowed in vegetated areas, which consequentially includes all wetlands.

Vegetation

No significant, adverse short-term or long-term impacts to vegetative resources are anticipated from the proposed action. Minor, temporary impacts to vegetation could occur. Patches of various vegetative species occur throughout the proposed testing area. Vegetation patches would not be marked due to the resource abundance. Vehicular traffic during deployment and retrieval activities would be

prohibited from traversing patches of vegetation. Test sensors can be placed by foot in vegetated areas; however, personnel would minimize trampling of back beach vegetation. Personnel would avoid trampling of beach and dune vegetation to the maximum extent practicable, such as sea oats (*Uniola paniculata*). Vegetation stabilizes the dune system, impacts to vegetation would impact the dune system as well.

No-Action Alternative

No significant, adverse short-term or long-term impacts to wetlands or vegetation are anticipated from the No-Action Alternative. Under the No-Action Alternative, NEST testing activities at Eglin AFB SRI property would not occur.

4.3 Cultural Resources

Preferred Alternative

No significant, adverse short-term or long-term impacts to cultural resources are anticipated from the proposed action. One area of protected cultural resources occurs within the proposed testing location. This area has been surveyed, but eligibility for NRHP has not been determined. If this area is found eligible for NRHP it would be fenced to prohibit access or intrusion (if found ineligible no fencing or marking would occur). If the site is found eligible and has not been fenced prior to the NEST demonstration tests, temporary markers would be installed to indicate the perimeter of the resource area, which would prevent test activities (deployment/retrieval of sensors and simulated intrusions) from encroaching upon the resource. In the event of unanticipated discoveries of cultural resources, all project activities would be suspended in the areas of discovery and Eglin AFB cultural resources personnel (96th Air Base Wing/Environmental Management Directorate, Historic Preservation Division [96 ABW/EMH]) would be notified for further evaluation.

No-Action Alternative

No significant, adverse short-term or long-term impacts to cultural resources are anticipated from the No-Action Alternative. Under the No-Action Alternative, NEST testing activities at Eglin AFB SRI property would not occur.

4.4 Coastal Zone Management

Preferred Alternative

The Proposed Action would occur within the State of Florida's designated coastal zone. After review of the FCMP and its enforceable policies, the USAF determined the proposed activities would have no effect on the State of Florida's coastal zone or its resources, and submitted a Negative Determination to FDEP. FDEP concurred with the Air Force's negative determination and agreed the Proposed Action meets the requirements of 15 C.F.R. 930.35. Both the Record of Negative Determination and the FDEP concurrence letter are included in Appendix A.

No-Action Alternative

No significant, adverse short-term or long-term impacts to the coastal zone are anticipated from the No-Action Alternative. Under the No-Action Alternative, the NEST testing activities at Eglin AFB SRI property would not occur.

4.5 Environmental Justice / Protection of Children from Environmental Health Risks

In accordance with EO 12898, dated February 11, 1994, the potential for disproportionately high adverse human health or environmental effects on minority or low-income populations has been assessed for the Proposed Action. Due to the nature and location of the Proposed Action (placing sensors on the ground and monitoring simulated intrusions on Eglin AFB SRI property), there would be no adverse impacts to minority or low-income populations.

Additionally, EO 13045, Protection of Children from Environmental Health Risks, mandates that federal agencies identify and assess environmental health and safety risks that may affect children as a result of the implementation of Federal policies, programs, activities and standards (63 Federal Register 19883-19888). The proposed alternatives would not impact schools, housing areas, or gathering places of children. The site is restricted by a guard/gate to access by military personnel. Therefore, there would be no short- or long-term impacts on the health and safety of children.

4.6 Mitigation Measures

No mitigation measures are proposed to offset impacts, as implementation of the Proposed Action would not result in any impacts to environmental resources. All sensitive resources would be avoided through management measures as discussed in Section 5 (e.g., vehicles would not be operated in vegetated areas, protected species' habitats, wetlands areas, or known cultural resource areas).

4.7 Cumulative Impacts

CEQ regulations for implementing NEPA define cumulative impacts as the impact on the environment from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what other agency (federal or non-federal) or person undertakes such actions (40 C.F.R. 1508.7).

The Eglin AFB property on SRI is a primary component of the Eglin Military Complex. Current land use activities on the SRI consist of military mission activities, natural and cultural resource management, and public use. Military mission activity occurs across the length of Eglin-owned property, while public use occurs only on county-owned property, the limited-access portion of the Island east of Ft. Walton Beach, and within the waters of the Gulf of Mexico, Santa Rosa Sound, and Choctawhatchee Bay. A Programmatic Environmental Assessment (PEA) for the SRI Mission Utilization Plan is currently underway (Draft January 2004) to analyze the cumulative environmental impacts of all current and anticipated future operations conducted on SRI and a Region of Influence (ROI) to include the Gulf-side shoreline of the Island to a depth of 30 feet. Although the PEA does not specifically address the proposed NEST test demonstration, the PEA does address military activities that are more intense and have more potential for impacts than the NEST demonstration test. The primary military mission activities at SRI are testing and training. Testing activities include air operations testing, electronic countermeasures and electronic systems testing, Surface-to-Air missile testing, OA HITL testing (300 foot tower), surf zone testing/training, hovercraft training and weapons testing, and ground testing. Training activities include personnel and equipment drops, and ground training operations (USAF 2004 Draft).

Any potential environmental impacts from the proposed NEST test would be avoided through implementation of management measures (as discussed in Section 4 and Section 5 of this EA). Because there would be no impacts from the Proposed Action, the Proposed Action would not contribute to any significant cumulative environmental impacts.

No permits would be required for implementation of the Proposed Action. A Safety Plan would be developed and implemented for carrying out the proposed NEST demonstration tests. Coordination with the USFWS has been accomplished by Eglin Natural Resources Biologists as requested in the Florida State Clearinghouse e-mail of June 10, 2004, Appendix A. The following management measures would be implemented during the NEST demonstration tests:

- All sensitive areas will be fenced/marked and avoided during the tests (i.e., cultural resource areas, piping plover habitat). Coordination with Eglin Cultural Resources Office (Mr. Mark Stanley, 850-882-8459) and the Eglin Natural Resources Branch (Mr. Bob Miller, 850-883-1153) is required prior to setting up for testing so that cultural resources and all known sea turtle nests can be identified and avoided.
- All project activities will be prohibited within 50 feet of sea turtle nests. Coordination with Eglin AFB Natural Resources Branch would be required prior to deployment of the sensors so that all known nests can be identified and avoided.
- If turtle nests are present during activities, personnel would be required to rake out ruts created by ATVs.
- Dunes greater than 5 feet in height will be avoided.
- Vehicles will not be used in vegetated or wetland areas. Sensors may be manually placed in vegetated / wetland areas, if trampling of vegetation can be minimized/avoided. Trampling of beach and dune vegetation (e.g., sea oats) will be avoided.
- In the event any sensitive areas (biological or cultural) are disturbed, measures should be taken to minimize impacts, and disturbances must be reported to Eglin AFB personnel (96th Air Base Wing/Environmental Management Directorate, Stewardship Division, Natural Resources Branch [96 ABW/EMSN] for natural resources [Mr. Bob Miller]; 96 ABW/EMH for cultural resources [Mr. Mark Stanley]).
- Safety concerns will be reported to the 46th Test Squadron Test Manager or Program Engineer (Mr. Jeff Grissom 850-882-8192).

6

List of Preparers

The Eglin AFB Point of Contact for the preparation of this EA is:

Alvin Jordan
96 ABW/EMSP
501 De Leon, Suite 101
Eglin Air Force Base, Florida 32542-5133

The contractor responsible for the preparation of this document is:

Ecology & Environment, Inc.
220 West Garden Street, Suite 404
Pensacola, Florida 32501

The following individuals contributed to the preparation of this EA:

Name	Role	Total Years' Experience	Project Responsibility
Douglas Heatwole	Program Manager	24	Quality Assurance (QA)
Kim Fitzgibbons	Project Manager	8	Project Management, Technical Oversight; Proposed Action; Alternatives; Coastal Zone; Cumulative Impacts
Michael Gartman	Environmental Scientist, GIS	4	Threatened and Endangered Species; Wetlands and Vegetation; Cultural Resources; Plans, Permits, and Management Requirements
Cindy Dick	Graphics	20	Graphics
Christina Vaggi	Technical Editor	7	Technical Editing

- Blair, W.F., 1951, Population structure, social behavior, and environmental relations in a natural population of the beach mouse, *Peromyscus polionotus leucocephalus*, *Contrib. Lab. Vert. Biol.*, University of Michigan 48: 1-47.
- Bowen, W.W., 1968, Variation and evolution of Gulf coast populations of beach mice, *Peromyscus polionotus*, *Bulletin of the Florida State Museum, Biological Science*, 12: 1-91.
- Bronsgerna, L.D., 1976, *Guide for the identification of standard turtles of British Coasts*, London, British Museum of Natural History.
- Dodd, C. Kenneth, 1992, Loggerhead Turtle, *Caretta caretta*, Pp. 128-134 in: *Rare and Endangered Biota of Florida. Volume III. Amphibians and Reptiles*, P. E. Moler, (ed.), University Press of Florida, Gainesville. 291 pp.
- Ehrhart, L. M. and B. E. Witherington, 1992, Green Turtle, *Chelonia mydas*, Pp. 90-94 in: *Rare and Endangered Biota of Florida. Volume III. Amphibians and Reptiles*, P. E. Moler, (ed.), University Press of Florida, Gainesville, 291 pp.
- Ehrhart, L.M. and Witherington, B.E., 1987, *Human and Natural Causes of Marine Turtle Nest and Hatchling Mortality and Their Relationship to Hatchling Production on an Important Florida Nesting Beach; Florida Game and Fresh Water Fish Commission Nongame Wildlife Program, Technical Report No. 1.*
- Ernst, Carl H., Roger W. Barbour, and Jeffrey E. Lovich, 1994, *Turtles of the United States and Canada*, Smithsonian Institution, Washington and London.
- Florida Natural Areas Inventory (FNAI), 2001, *Field Guide to the Rare Animals of Florida*, <http://www.fnai.org/fieldguide>.
- Georgia Museum of Natural History and Georgia Department of Natural Resources 1 June 2000; Georgia Wildlife Web, *Dermochelys coriacea*.
museum.nhm.uga.edu/gawildlife/reptiles/testudines/dermochelyidae/dcoriacea.html
- Marquez, M. R., 1990, *FAO Species Catalogue. Vol. 11. Sea Turtles of the World*, FAO Fisheries Synopsis, No. 125 Vol. 11, Rome, FAO, 81 pp.
- Miller Bob, 2002b, personal communication on April 10, 2002 between Kerry Flaherty, Ecology & Environment, Inc., and Bob Miller, AAC/EMSN, Eglin AFB.
- Moler, P.E., 1992, *Rare and Endangered Biota of Florida, Vol. III, Amphibians and Reptiles*, University Presses of Florida, Gainesville, Florida.

National Research Council (NRC), 1990, *Decline of the Sea Turtles: Causes and Prevention*. National Academy Press, Washington, D.C.

Printiss, David and Dan Hipes, 1999, *Rare Amphibian and Reptile Survey of Eglin Air Force Base, Florida*, Florida Natural Areas Inventory, Contract Number FO8651-97-M-S601.

Rodgers, James, Herbert Kale, and Henry Smith, 1996, *Rare and Endangered Biota of Florida, Volume V. Birds*, University Press of Florida, Gainesville.

United States Air Force (USAF), 2004, DRAFT Programmatic Environmental Assessment Santa Rosa Island Mission Utilization Plan, Eglin Air Force Base, Florida.

United States Air Force (USAF), 2002, *Integrated Natural Resources Management Plan, Eglin Air Force Base, FL*, Eglin AFB AAC/EMSN, Jackson Guard.

United States Air Force (USAF), 1999, *Integrated Natural Resources Transitional Plan, Eglin Air Force Base, FL, 1998-2001*, Eglin AFB AAC/EMSN, Jackson Guard.

United States Air Force (USAF), 1997, Santa Rosa Island Environmental Baseline Document, Air Force Development Test Center, Eglin Air Force Base, Florida.

United States Fish and Wildlife Service (USFWS), 2001, *Critical Habitat for Piping Plover*, <http://plover.fws.gov>.

Wooten, M.C., 1994, *Estimation of genetic variation and systematic status of populations of the beach mouse, Peromyscus polionotus, with considerations for management*, FGFWFC, Nongame Wildlife Program, Final Report, 38 pp + v. Tallahassee, FL.

A

**Coastal Zone Management Act
Negative Determination**

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) NEGATIVE DETERMINATION

Introduction

This document provides the State of Florida with the U.S. Air Force's Negative Determination under CZMA Section 307 and 15 C.F.R. Part 930. The information in this Negative Determination is provided pursuant to 15 C.F.R. Section 930.35 (b).

Pursuant to Section 307 of the Coastal Zone Management Act, 16 U.S.C. § 1456, as amended, its implementing regulations 15 C.F.R. 930.35 this is a Federal Negative Determination for activities described within the Network Embedded Systems Technology (NEST) Environmental Assessment (EA), Eglin Air Force Base, FL.

Proposed Federal agency action:

The 46 Test Wing proposes to utilize Eglin's Santa Rosa Island land areas between Test Area A-13 (the 300 ft tower) and Test Area A-18 (the western most point of the test ranges) (Figure 1) to conduct testing of the NEST Program by Defense Advanced Research Projects Agency (DARPA). The layout of this western portion of the island, facilities, and roadway are ideal for this NEST demonstration and testing.

The NEST demonstration test would consist of deploying 8,000 to 10,000 sensors spread over an area of approximately 1 km by 10 km. Two Test/Demonstration Events are planned. The first event would be a twelve day dry run demonstration in October 2004. The second event would be a twelve day test demonstration for distinguished visitors (DVs) in December 2004. The DV observers would utilize the 300 Ft Tower at Test Area A-13. It is anticipated that sensors will be deployed on days 1 and 2 of each event and retrieved on the final two days of each event. Use of All Terrain Vehicle's (ATV's) in the test area would be required to initially place the sensors, and later to retrieve them. Environmentally sensitive areas would be avoided. Placing and retrieving the sensors will be labor intensive given the number of sensors and the area to be covered. The NEST area must be guarded while the sensors are deployed.

The NEST sensors are cone shaped and battery powered (Figure 2). Each sensor is approximately eight inches tall and eight inches wide at the base. They would be placed in a checkerboard pattern to form a network around an asset to be protected (a pipeline, for example). Sensors are placed on the surface of the ground (digging is not required) and are spaced approximately 20 to 40 meters apart. The sensors detect seismic activity. When a sensor detects such activity, it communicates with other sensors and with several "HUBS" located within the network. If an intruder were to approach the asset being protected (a pipeline, for example) sensors would detect the seismic activity of the intruder and would relay that data to a "HUB" within the network and ultimately to an operator with a display screen. All data is relayed by RF (radio frequency) means and no

hard wiring is required. The intruder's movements can be determined by the sensors and data transmissions (of the HUB) to the operator.

The SRI locations meet test site requirements specified by DARPA. It is relatively flat and open and offers a real world environment of varying topography. The NEST test area is not required to be rectangular or rectilinear. It may be irregularly shaped. The hard surface road running the length of the test area would serve as a baseline for deploying and recovering the sensors (and the road would simulate the pipeline being protected as well). There are no thick forests or vegetation (a light to moderate vegetation with some trees is ideal). There are no large physical obstructions to line of sight communications such as groups of large buildings. Small obstructions or single buildings would not affect the demonstration. It is easy for observers on this western SRI test area to see large sections of the experiment site from various vantage points.

Federal Review

After review of the Florida Coastal Management Program and its enforceable policies, the U.S. Air Force has made a Negative Determination that this activity is one that will not have an affect on the state of Florida's coastal zone or its resources.



Figure 1 Santa Rosa Island, Eglin Air Force Base, FL

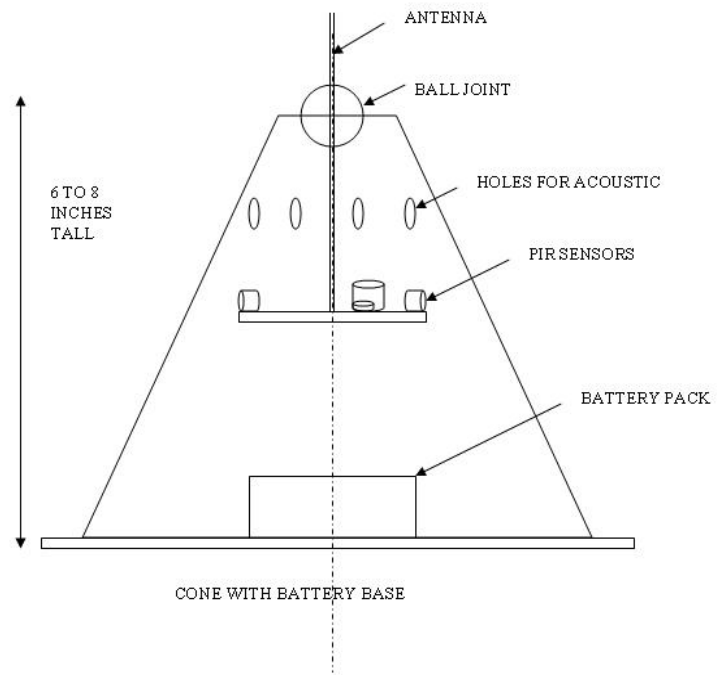


Figure 2 NEST SENSOR

Florida Coastal Management Program Consistency Review

Statute	Consistency	Scope
Chapter 161 <i>Beach and Shore Preservation</i>	The proposed project would not adversely affect beach and shore management, specifically as it pertains to: -The Coastal Construction Permit Program. -The Coastal Construction Control Line (CCCL) Permit Program. -The Coastal Zone Protection Program. All land activities would occur on federal property.	Authorizes the Bureau of Beaches and Coastal Systems within DEP to regulate construction on or seaward of the states' beaches.
Chapter 163, Part II <i>Growth Policy; County and Municipal Planning; Land Development Regulation</i>	All activities would occur on federal property.	Requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest.
Chapter 186 <i>State and Regional Planning</i>	All activities would occur on federal property.	Details state-level planning requirements. Requires the development of special statewide plans governing water use, land development, and transportation.
Chapter 252 <i>Emergency Management</i>	The proposed action would not increase the state's vulnerability to natural disasters. Emergency response and evacuation procedures would not be impacted by the proposed action.	Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.
Chapter 253 <i>State Lands</i>	All activities would occur on federal property.	Addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands.
Chapter 258 <i>State Parks and Preserves</i> Chapter 259 <i>Land Acquisition for Conservation or Recreation</i>	State parks, recreational areas and aquatic preserves would not be affected by the proposed action. Tourism and outdoor recreation would not be affected. Opportunities for recreation on state lands would not be affected. Land acquisition for recreational trails would not be affected.	Addresses administration and management of state parks and preserves (Chapter 258). Authorizes acquisition of environmentally endangered lands and outdoor recreation lands (Chapter 259).

Chapter 260 <i>Recreational Trails System</i>		Authorizes acquisition of land to create a recreational trails system and to facilitate management of the system (Chapter 260).
Chapter 375 <i>Multipurpose Outdoor Recreation; Land Acquisition, Management, and Conservation</i>		Develops comprehensive multipurpose outdoor recreation plan to document recreational supply and demand, describe current recreational opportunities, estimate need for additional recreational opportunities, and propose means to meet the identified needs (Chapter 375).
Chapter 267 <i>Historical Resources</i>	All cultural resources located in the area of the proposed action are marked and placement and retrieval of sensors will avoid all of these known locations. There would be no impact to cultural resources as a result of NEST activities.	Addresses management and preservation of the state's archaeological and historical resources.
Chapter 288 <i>Commercial Development and Capital Improvements</i>	The proposed action would occur on federal property. The proposed action is not anticipated to have any effect on future business opportunities on state lands, or the promotion of tourism in the region.	Provides the framework for promoting and developing the general business, trade, and tourism components of the state economy.
Chapter 334 <i>Transportation Administration</i>	The proposed project would not have an impact on transportation.	Addresses the state's policy concerning transportation administration (Chapter 334).
Chapter 339 <i>Transportation Finance and Planning</i>	The proposed project would have no effect on the finance and planning needs of the state's transportation system.	Addresses the finance and planning needs of the state's transportation system (Chapter 339).
Chapter 370 <i>Saltwater Fisheries</i>	The proposed action would not affect saltwater fisheries.	Addresses management and protection of the state's saltwater fisheries.
Chapter 372 <i>Wildlife</i>	There would be no impact to wildlife resources. Activities on the beach will occur at the end of October when all turtle nests have hatched. Furthermore, all turtle nests are marked and will be avoided. Piping Plover critical habitat exists at Test Area A-18, however the boundaries will be marked and all placement and retrieval activities will avoid that area.	Addresses the management of the wildlife resources of the state.
Chapter 373 <i>Water Resources</i>	Wetlands exist in many portions of Santa Rosa Island. NEST activities will require the use of wetlands, however there will be no digging within or alteration to these areas. Best management	Addresses the state's policy concerning water resources.

	practices will be employed during use of the ATV's to place and retrieve the sensors. Extremely sensitive areas will be marked and avoided.	
Chapter 376 <i>Pollutant Discharge Prevention and Removal</i>	The proposed action does not involve the transfer, storage, or transportation of pollutants.	Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.
Chapter 377 <i>Energy Resources</i>	Energy resource production, including oil and gas, and the transportation of oil and gas, would not be affected by the proposed action.	Addresses regulation, planning, and development of energy resources of the state.
Chapter 380 <i>Land and Water Management</i>	The proposed action would occur on federally owned lands. Under the proposed action, development of state lands with regional (i.e. more than one county) impacts would not occur. Areas of Critical State Concern or areas with approved state resource management plans such as the Northwest Florida Coast would not be affected. Changes to coastal infrastructure such as bridge construction, capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing or construction would not occur.	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.
Chapter 381 <i>Public Health, General Provisions</i>	The proposed action does not involve the construction of an on-site sewage treatment and disposal system.	Establishes public policy concerning the state's public health system.
Chapter 388 <i>Mosquito Control</i>	The proposed action would not affect mosquito control efforts.	Addresses mosquito control effort in the state.
Chapter 403 <i>Environmental Control</i>	The proposed action would not have an affect on air quality. There would be no discharges into ground water or surface water.	Establishes public policy concerning environmental control in the state.
Chapter 582 <i>Soil and Water Conservation</i>	There would be no impact to soils as a result of the proposed action. Sensor placement will occur on land; however no digging is required for the NEST activities.	Provides for the control and prevention of soil erosion.

Poirier Jennifer M Contr AAC/EMSN

From: Milligan, Lauren [Lauren.Milligan@dep.state.fl.us]
Sent: Thursday, June 10, 2004 9:33 AM
To: Poirier Jennifer M Contr AAC/EMSN
Cc: Bob Miller (Miller Bob Civ AAC/EMSNW); Lawson, Daniel
Subject: RE: Negative Determination for NEST

Ms. Jennifer Poirier, Environmental Scientist
Eglin AFB - Natural Resources Branch
107 Highway 85 North
Niceville, FL 32578

RE: Department of the Air Force - Negative Determination - Network Embedded Systems Technology (NEST) Demonstration and Testing on Santa Rosa Island, Eglin Air Force Base - Santa Rosa and Okaloosa Counties, Florida.
SAI # FL200406106760

Dear Jennifer:

The Florida State Clearinghouse is in receipt of your notice regarding the U.S. Air Force's proposal to perform NEST demonstration and testing activities on Santa Rosa Island, Eglin AFB. Department staff does not object to the Air Force's negative determination and agrees that the proposed action meets the requirements of 15 CFR 930.35.

As noted by Dan Lawson previously, please coordinate with Florida Fish and Wildlife Conservation Commission and/or U.S. Fish and Wildlife Service staff to determine whether specific measures will be necessary during the test month(s) proposed to avoid impacts to sea turtle adults, nests, or hatchlings and piping plovers utilizing habitat within the test areas.

Thank you for the opportunity to review this proposal. If you have any questions or need further assistance, please contact me at (850) 245-2170.

Sincerely,

Lauren P. Milligan, Environmental Consultant
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Blvd, Mail Station 47
Tallahassee, Florida 32399-3000
ph. (850) 245-2170
fax (850) 245-2190

-----Original Message-----

From: Poirier Jennifer M Contr AAC/EMSN [mailto:jennifer.poirier@eglin.af.mil]
Sent: Wednesday, June 09, 2004 2:58 PM
To: Milligan, Lauren
Cc: Bob Miller (Miller Bob Civ AAC/EMSNW); Lawson, Daniel
Subject: Negative Determination for NEST

6/10/2004

Ms. Lauren P. Milligan, Environmental Consultant
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, Mail Station 47
Tallahassee, FL 32399-4700

Dear Lauren,

Attached is the US Air Force's proposal for the testing of the Network Embedded Systems Technology at Santa Rosa Island, Eglin Air Force Base, FL. We are submitting this CZMA Negative Determination under 15 C.F.R. 930.35. Please consider a five-day review period on this project and a response via e-mail.

If you require additional information or have any questions or concerns, I can be reached at (850)882-8397.

Thank you,

Jennifer

*Jennifer Poirier
Environmental Scientist
Science Applications International Corporation
Eglin AFB-Natural Resources Branch
107 Highway 85 North
Niceville, FL 32578
(850)882-8397 work
(850)882-5321 fax
poirier@eglin.af.mil*